



Food Safety Information



Is Pink Turkey Meat Safe?

The color pink in cooked turkey meat raises a "red flag" to many diners and cooks. Conditioned to be wary of cooked fresh pork that looks pink, they question the safety of cooked poultry and other meats that have a rosy blush.

Numerous callers to the USDA Meat and Poultry Hotline report being alarmed when seeing "pink." To them, it means "unsafe" or "under-done."

"I cooked my turkey until done according to the directions, but when I sliced the breast meat, it was still pink near the bone," said an Oklahoma caller. "Is it safe?"

"We had a big family argument at Thanksgiving dinner. Aunt Mildred wouldn't eat the turkey because it looked pink," reported the beleaguered cook from a Wisconsin family.

The color of cooked meat and poultry is not always a sure sign of its degree of doneness. Only by using a food thermometer can one accurately determine that a meat has reached a safe temperature. Turkey, fresh pork, ground beef or veal can remain pink even after cooking to temperatures of 160 °F and higher. The meat of smoked turkey is always pink.

To understand some of the causes of "pinking" or "pinkening" in fresh turkey, it's important to know first what gives meat its natural color.

Why is Poultry Lighter in Color Than Beef?

The protein *myoglobin* is the major pigment found in all vertebrates and can exist in various forms which determine the resulting meat color. The major reason that poultry meat is much lighter in color than beef is that it is dramatically lower in myoglobin. Also, as an animal becomes older, its myoglobin content usually increases. Turkeys today are young - 4 to 5 months old at the time of slaughter.

Why Are White and Dark Meat of Poultry Different Colors?

The pink, red or white coloration of meat is due primarily to oxygen-storing myoglobin which is located in the muscle cells and retains the oxygen brought by the blood until the cells need it. To some extent, oxygen use can be related to the bird's general level of activity: muscles that are exercised frequently and strenuously - such as the legs - need more oxygen, and they have a greater storage capacity than muscles needing little oxygen. Turkeys do a lot of standing around, but little if any flying, so their wing and breast muscles are white; their legs, dark.

What Causes Well-Done Meat to Be Pink?

1. Chemical Changes During Cooking.

Scientists have found that pinkness occurs when gases in the atmosphere of a heated gas or electric oven react chemically with hemoglobin in the meat tissues to give poultry a pink tinge. They are the same substances that give red color to smoked hams and other cured meats.

The presence of high levels of myoglobin, or some of its redder forms, due to incomplete denaturation during heat processing can account for poultry having a pink to red color similar to that of an undercooked product.

2. High Cytochrome c Levels.

A component of hemo-protein in the turkey meat, *cytochrome c* requires a much higher temperature (above 212 °F) to lose its pink color than myoglobin. Because turkey is tender and done at 180 °F, heating it to above 212 °F to change the pink color of cytochrome c would make it so dry and tough, it would be almost inedible.

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3. Natural Presence of Nitrites.

Nitrites are commonly used to produce a desired pink color in traditionally cured meats such as ham or bologna. So it follows that the natural presence of nitrates and nitrites either in the feed or water supply used in the production of poultry are a factor in nitrite levels in the birds.

One study found that during 40 hours of storage at 40 °F, naturally occurring microorganisms converted nitrate to nitrite. It also found that the local water supply had nitrate and thus it could serve as a nitrate source during processing.

4. Young Age of Meat.

Often meat of younger birds shows the most pink because their thinner skins permit oven gases to reach the flesh. The amount of fat in the skin also affects the amount of pink color. Young birds or animals also lack the shield of a fat covering.

5. Grilling.

Meat and poultry grilled or smoked outdoors can also look pink, even when well done. There may be a pink-colored rim about one-half inch wide around the outside of the cooked meat. The meat of commercially smoked turkeys is usually pink because it is prepared with natural smoke and liquid smoke flavor.

How to Test for Doneness

The best way to be sure a turkey - or any meat - is cooked safely and done is to use a food thermometer. If the temperature of the turkey as measured in the thigh has reached 180 °F and is done to family preference, all the meat - including any that remains pink - is safe to eat.

Food Safety Questions?

Call the USDA Meat & Poultry Hotline

If you have a question about meat, poultry or egg products, call the USDA Meat and Poultry Hotline toll free at **1-888-MPHotline** or **1-888-674-6854**, TTY: 1-800-256-7072.



The hotline is open year-round Monday through Friday

from 10 a.m. to 4 p.m. EST
(English or Spanish).

Listen to timely recorded food safety messages at the same number 24 hours a day. Check out the FSIS Web site at www.fsis.usda.gov.

Send e-mail questions to MPHotline.fsis@usda.gov.

Ask Karen!

FSIS' automated response system can provide food safety information 24/7



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